

Appln. No. 10/799,385
Amdt. dated January 10, 2006
Reply to Office Action of July 11, 2005

Amendments to the Claims:

Please amend claims 1-4 and 6-11 as follows. The following listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

Claim 1 (Currently Amended). A liquid pressurizing device comprising:

a reciprocating pump for pressurizing and delivering a high pressure liquid through reciprocating motion of a plurality of plungers;

rotary servo motor means for driving the reciprocating motion of the plurality of plungers;

pressure measuring means for measuring an actual delivery pressure value of said high pressure liquid;

10 pressure control means for adjusting a feed rate of reciprocating motion of said plungers so that the actual delivery pressure value measured by said pressure measuring means is converged to a preset pressure value as a desired value;

15 means to compare the measured actual delivery pressure value with a predetermined threshold which is close to and lower than said preset pressure value;

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means to control the reciprocating motion of the plurality of plungers through said rotary servo motor means depending on the result of the comparison to make the actual delivery pressure value reach the predetermined threshold if the threshold has not been reached;

20 means for determining to determine the feed rate as an optimum feed rate of the reciprocating motion of the plurality of plungers when the threshold is reached after the actual delivery pressure value reaches a predetermined threshold; and

25 means for maintaining to control the feed rate of the reciprocating motion of the plurality of plungers through said rotary servo motor means at said optimum feed rate after the threshold has been reached.

Claim 2 (Currently Amended). A liquid pressurizing device according to claim 1, wherein said pressure control means comprises a proportional control means for performing, after the actual delivery pressure value has reached the predetermined threshold, the proportional control of the actual delivery pressure value during a time [[until]] taken for the plungers to first reach an end of a forward stroke end thereof.

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Claim 3 (Currently Amended). A liquid pressurizing device
10 according to claim 1, wherein ~~after said optimum feed rate has~~
~~been determined,~~ said pressure control means further comprises
means to correct ~~corrects~~ the feed rate on the basis of the
deviation between the actual delivery pressure value and said
preset pressure value when the direction of the reciprocating
15 motion of the plurality of plungers is changed after said optimum
feed rate has been determined.

Claim 4 (Currently Amended). A liquid pressurizing device
according to claim 1, wherein ~~after said optimum feed rate has~~
20 ~~been determined,~~ said pressure control means further comprises
means to temporarily [[sets]] set the feed rate to a rate higher
than said optimum feed rate when the direction of reciprocating
motion of the plungers is changed after said optimum feed rate
has been determined.

Claim 5 (Original). A liquid pressurizing device
comprising:

a reciprocating pump for pressurizing and delivering a high
pressure liquid through the reciprocating motion of a plurality
5 of plungers;

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pressure measuring means for measuring an actual delivery pressure value of said high pressure liquid;

a nozzle for injecting said high pressure liquid;

pressure control means for adjusting the feed rate of reciprocating motion of said plungers so that the actual delivery pressure value measured by said pressure measuring means is converged to a preset pressure value as a desired value;

detecting means for detecting an injection state and a suspension state of said high pressure liquid from said nozzle;

means for determining an optimum feed rate of the reciprocating motion of the plurality of plungers after the actual delivery pressure value reaches a predetermined threshold; and

means for maintaining the feed rate of the reciprocating motion of the plurality of plungers at said optimum feed rate, wherein said pressure control means is responsive to the detection of the suspension state by said detecting means to stop the movement of said plungers when said preset pressure value is nearly reached.

Claim 6 (Currently Amended). A liquid pressurizing device according to claim 5, wherein said pressure control means is

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responsive to the detection of the suspension state by said detecting means to stop the movement of said plungers and is
5 responsible to the detection of a reinjection by said detecting means to effect the movement of said plungers at said optimum [[fee]] feed rate.

Claim 7 (Currently Amended). A liquid pressurizing device comprising:

a reciprocating pump for pressurizing and delivering a high pressure liquid through the reciprocating motion of a plurality 5 of plungers;

pressure measuring means for measuring the actual delivery pressure value of the high pressure liquid;

a plurality of nozzles for injecting the high pressure liquid;

10 pressure control means for adjusting the feed rate of reciprocating motion of the plungers so that the actual delivery pressure value measured by said pressure measuring means is converged to a preset pressure value as a desired value; and
detecting means for detecting an injection state and a
15 suspension state of the high pressure liquid from each of said nozzles;

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means for determining an optimum [[fee]] feed rate of the reciprocating motion of the plungers with the control operation of the actual delivery pressure value after reaching a
20 predetermined threshold; and

means for maintaining the feed rate of the reciprocating motion of the plungers constant at said optimum feed rate,

wherein said pressure control means is responsive to the detection of any change between said injection state and
25 suspension state of each of said nozzles by said detecting means so that the feed rate of the reciprocating motion of said plungers is changed to the optimum feed rate corresponding to the injection state and suspension state of each of said nozzles after the change between the injection state and suspension

30 state.

Claim 8 (Currently Amended). A liquid pressurizing device according to claim 2, wherein ~~after said optimum feed rate has been determined,~~ said pressure control means further comprises means to correct corrects the feed rate on the basis of the deviation between the actual delivery pressure value and said
5 preset pressure value when the direction of the reciprocating

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motion of the plungers is changed after said optimum feed rate has been determined.

Claim 9 (Currently Amended). A liquid pressurizing device according to claim 2, wherein ~~after said optimum feed rate has been determined,~~ said pressure control means further comprises means to temporarily [[sets]] set the feed rate to a rate higher than said optimum [[fee]] feed rate when the direction of reciprocating motion of the plurality of plungers is changed after said optimum feed rate has been determined.

Claim 10 (Currently Amended). A liquid pressurizing device according to claim 3, wherein ~~after said optimum feed rate has been determined,~~ said pressure control means further comprises means to temporarily [[sets]] set the feed rate to a rate higher than said optimum feed rate when the direction of reciprocating motion of the plungers is changed after said optimum feed rate has been determined.

Claim 11 (Currently Amended). A liquid pressurizing device according to claim 8, wherein ~~after said optimum feed rate has been determined,~~ said pressure control means further comprises

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means to temporarily [[sets]] set the feed rate to a rate higher
5 than said optimum feed rate when the direction of reciprocating
motion of the plurality of plungers is changed after said optimum
feed rate has been determined.